Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Thompson River

Water Body Segment at a Glance:

County: Harrison
Nearby Cities: Cainsville and Mount Moriah
Length of impaired segment: 65 miles
Length of impairment within segment: 5 miles
Pollutant: Bacteria
Source: Rural Nonpoint Sources
Water Body ID: 0549

State Map Showing Location of Watershed

Scheduled for TMDL development: 2016

Description of the Problem

Designated beneficial uses of Thompson River

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category B
- Public Drinking Water Supply
- Irrigation

Use that is impaired

- Whole Body Contact Recreation – Category B

Standards that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E.coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

Background information and water quality data

The Thompson River begins in Iowa and flows south into Missouri in Harrison County near Akron. It joins the Grand River in Livingston County. Only five miles of the Thompson River in Harrison

County have been identified as impaired. Evidence for the bacteria impairment is based on data collected by Iowa Department of Natural Resources from 1999-2008 from a site a few miles north of state line (near Davis City).

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. *E. coli*, are bacteria found in the intestines of warm blooded animals and are are used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine[1,2]. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

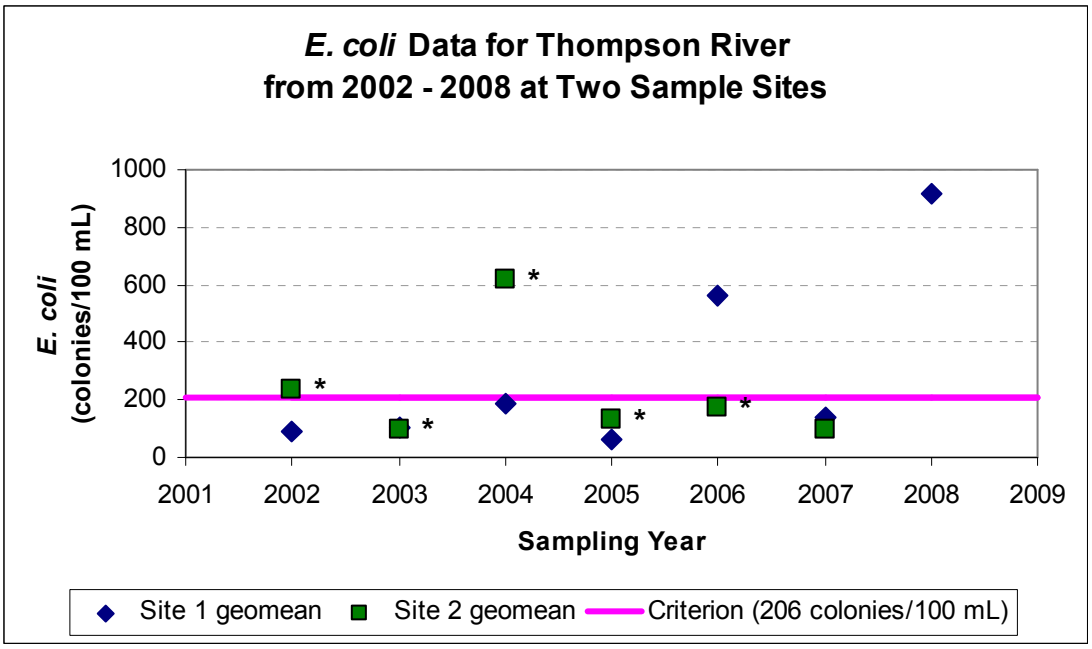
The Thompson River is designated as Category B for the whole body contact recreation use, which means it has places deep enough for total immersion (i.e., swimming), but they may be on private lands or inaccessible to the public. The *E. coli* criterion of 206 col/100 mL for Category B waters is interpreted as the geometric mean of at least five samples collected during the recreational season (April 1 through October 31) of any given year. This criterion has been exceeded in the Thompson River for 2 of last 3 years (2006 and 2008). The U.S. Geological Survey gathered additional bacteria data from 2002-2008 at Mount Moriah, Mo. (site 2). However, according to Missouri's Listing Methodology, these data show no bacteria impairment. Though the "geometric mean" for 2002 and 2004 plot above the criterion at site 2 (the square data points in the graph on the next page), they only included three and two samples respectively and they are older than the most recent three years of available data. Therefore, they do not indicate impairment.

People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take common sense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.

There is a map on the last page of the Thompson River showing the impaired segment and the location of the sampling sites.

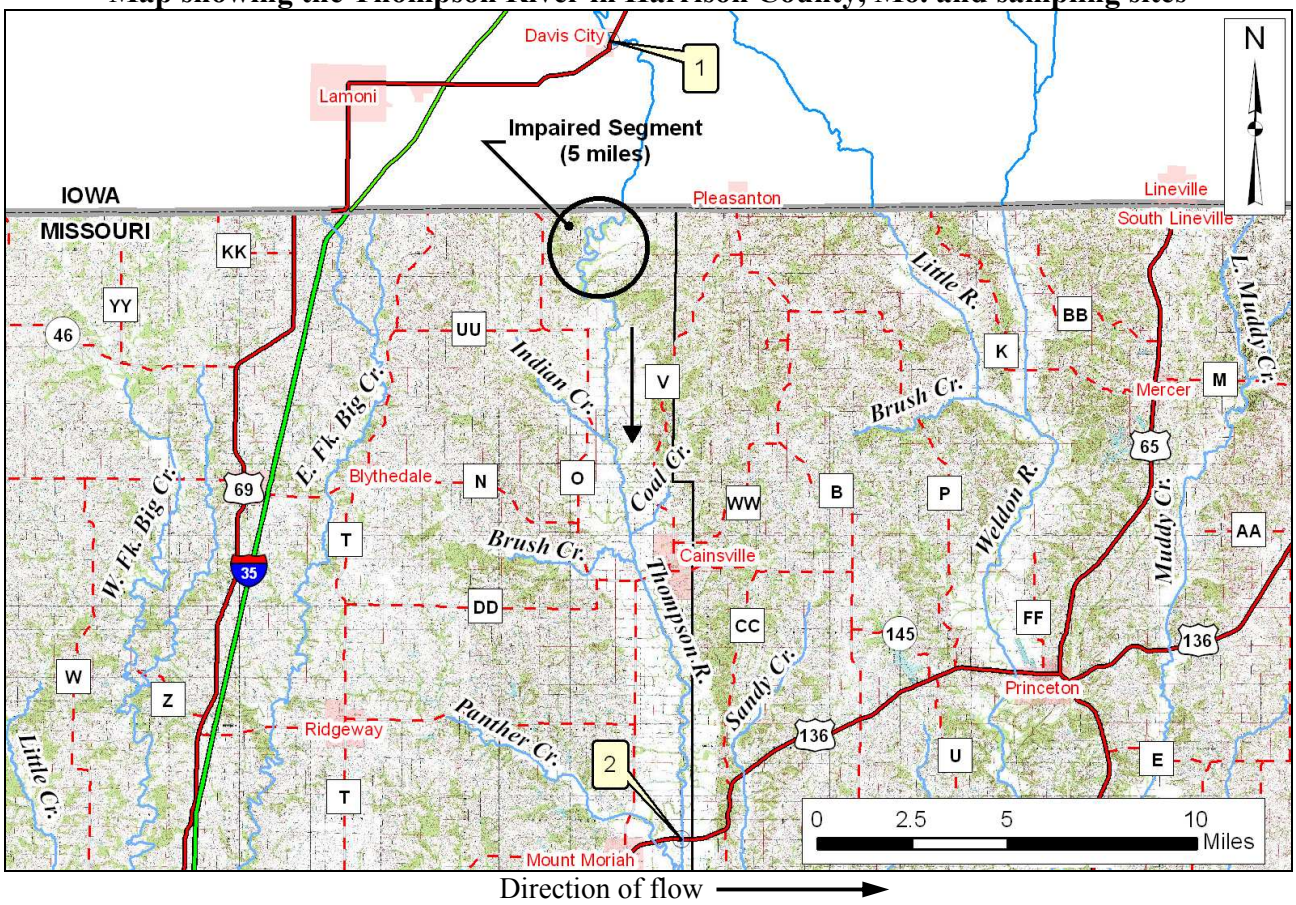
[1] Hudault S, Guignot J, Servin AL (July 2001). "*Escherichia coli* strains colonising the gastrointestinal tract protect germfree mice against *Salmonella typhimurium* infection". *Gut* **49** (1): 47–55

[2] Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424–8.



* Geomean calculated using fewer than five samples

Map showing the Thompson River in Harrison County, Mo. and sampling sites



Sample Sites

1 – Thompson River at Davis City, Iowa
2 – Thompson River at Mt. Moriah, Mo.

For more information call or write:

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